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Non-laminar motion of biological suspension: an illustration for blood cell passing a 3-micrometer capillary[1] IAT NENG CHAN, University of Macau — Discovering in video images of blood cell motion, a new concept is developed for cell passing a tight capillary that has a large difference compared to the published simulation results. In video image the deformation of moving blood cell shows abnormal pressure from cell membrane under highly contacted condition with capillary wall. Moreover, when the cell struggles through the narrow capillary the appearance of additional force to assist the cell motion is necessary. In more detail analysis, the flow motion in capillary displaying a non-laminar pattern which is obviously different to that shows in a nearby larger capillary on the same image, can be explained as a non-regular flow described by an equivalent flow companied with sink and source. Using this illustration with the calculated volumes for normal and deformed cells, the flow speed and pressure are derived to compare with the best known results and also to the calculated flow speed from the images. After compared to diffusion effect, the exchange rate of materials in the flow and the efficiency factor to the circulatory system can be estimated.

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